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CLASSIFICATION OF THE HORNTAILS AND SAWFLIES, OR THE SUB-ORDER PHYTOPHAGA.

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FAMILY VIII.—LOPHYRIDÆ.

The Swedish entomologist, C. G. Thomson, first separated this family as a tribe in 1871. It had been placed previously with the *Lydides*, with which it had no affinity whatever. In the structure of the head, thorax and abdomen the species approach closest to the *Hylotomidæ*, *Perreyiidæ* and the *Pterygophoridæ*. The multiarticulate antennæ, however, separate them at once from the former; the distinct anal cell in the hind wings separates them from the *Perreyiidæ*, which have none; while from the last, to which they are undoubtedly most closely allied, they are readily distinguished by having a distinct lanceolate cell in the front wings.

The larvæ are social in their habits and feed exclusively upon coniferous trees—the pines, firs and cedars. Only two or three species are known outside of the Palearctic and Nearctic regions.

But two genera are known, distinguished as follows:

Table of Genera.

Hind wings with two discal cells; front wings with the second and third submarginal cells each receiving a recurrent nervure.

Lanceolate cell with a straight or an oblique nervure; ♂ antennæ ramose..... *Lophyrus*, Latreille.

Lanceolate cell contracted at middle, closed; ♂ antennæ bi-ramose..... *Monoctonus*, Dahlbom.

FAMILY IX.—PERREVIIDÆ.

The absence of an anal cell in the hind wings readily separates this family from the *Lophyridæ*.

The group was first recognized by Cameron as a subfamily in 1883, who, however, placed in it only three genera, viz.: *Decameria*, *Lophy-*

roides and *Perreyia*. He says: "This group has usually been regarded as a section of the Lophyrina; but it differs in so many points not only from that group, but from all others, that I am justified, I think, in making a distinct section of it, and have given above the distinctive characters of the subfamily."*

Below I have placed in the group several other genera placed elsewhere by Cameron and Kirby. No species is known in our fauna, and the group, as a whole, seems to be confined to the Neotropical and Australian regions.

The genera belonging to the family may be readily distinguished by the aid of the following table:

Table of Genera.

- Marginal cell simple, not appendiculate.....7.
 Marginal cell appendiculate, the lanceolate cell petiolate.
 Second and third submarginal cells each receiving a recurrent nervure, rarely with the first recurrent interstitial with the first transverse cubitus.....3.
 Second submarginal cell receiving both recurrent nervures; antennæ 13-15-jointed.....2.
 2. Hind wings without a discal cell, the marginal cell with an appendage; ♂ antennæ 15-jointed, biramose.....Lophyroides, Cameron.
 (Type *L. ruficollis*, Cam.)
 Hind wings with one discal cell, the marginal cell *without* an appendage; ♀ antennæ 14-jointed, ♂ 15-jointed; maxillary palpi 4-, labial palpi 3-jointed.....Lophyridea, Ashm., n. g.
 (Type *L. tropicus*, Nort **)
 Hind wings with one discal cell, the marginal cell *with* an appendage; antennæ 15-jointed in both sexes; maxillary palpi 2-, labial palpi 1-jointed.....Perreyia, Brullé.
 3. Hind wings *with* one discal cell (a closed submarginal).....4.
 Hind wings *without* a discal cell.
 ♀ antennæ 13-jointed, the third joint very long, the following gradually shortening.....Ancyloneura, Cameron.
 4. Antennæ 16-jointed, longer* than the body.....6.
 Antennæ 9-11-jointed, shorter than the body.....5.

*Biol. Centr. Am. Hym., Vol. I., p. 60.

**Cameron placed this species in his genus *Lophyroides*.

5. Antennæ 9-jointed, the third joint as long as joints 4-6 united; second and third submarginal cells subequal, larger than the first.
 ♀ Eurys, Newman.
 Antennæ 10-jointed, the third joint scarcely as long as joints 3-4 united; second submarginal cell twice as long as the third.
 ♀ Acherocerus, Kirby.
 Antennæ 11-jointed, the third joint long, about as long as the three following joints united.
 Second submarginal cell longer than either the first or third united; maxillary palpi 6-, labial palpi 4-jointed.
 ♀ Camptobrium, Spinola.
 Second submarginal cell shorter than either the first or third.
 Maxillary palpi 4-, labial palpi 3-jointed.
 ♀ Euryopsis, Kirby.
 Maxillary palpi 3-, labial palpi 1-jointed.
 ♀ Decameria, Lepel.
6. Head subquadrate, the temples broad; flagellar joints long, each giving off a ramus from near the base. ♂ Cladomacra, Smith.
7. Antennæ 18-jointed, the flagellar joints scarcely longer than thick, each throwing off from near the extremity a long pilose ramus; hind wings with one discal cell; head transverse, the temples narrow. ♂ Polyclonus, Kirby.

FAMILY X.—PTERYGOPHORIDÆ.

This group by most authorities has been placed with the *Cimbicidæ*, possibly on account of some of the species possessing clavate antennæ, similar to *Cimbex*. The family is, however, structurally, totally different from them, and to me shows no affinity whatever with the *Cimbicidæ*; it is in every respect more closely allied to the *Lophyridae*, *Perreyiidae* and the *Selandriidae*, from all of which it is readily distinguished by the absence of the lanceolate cell in the front wings.

It may be divided into three subfamilies, two of which, however, are not sharply separable, and I have had some difficulty in finding characters to distinguish them. The venation, especially in many of the genera in the subfamily *Pterygophorinæ*, has been most perplexing, since I find it totally different in the opposite sexes of the same species. Some of the females too have clavate antennæ, and thus closely mimic the females in the subfamily *Perginæ*.

It is believed, however, that these difficulties have been surmounted and that other students will now have no trouble in recognizing these subfamilies by the use of the following table :

Table of Subfamilies.

Cubitus originating from the subcostal vein beyond the apex of the basal nervure.....2.

Cubitus originating from the apex of the basal nervure or only a little away from it.

Costal vein slender towards base, but very much thickened or broadened at apical one-third; marginal cell not appendiculated and with no space between its apex and the costal margin; antennæ short, filiform in both sexes, from 6-10-jointed.....Subfamily I., Lobocerinae.

Costal vein not very much thickened and almost of a uniform thickness throughout; marginal cell at apex a little away from the costal margin, and appendiculated; first dorsal abdominal segment emarginate, or with a median slit; ♀ antennæ short clavate, 5-8-jointed, or filiform subdentate, 14-20-jointed; antennæ usually ramose or flabellate.....Subfamily II., Pterygophorinae.

2. Submedian cell always shorter than the median, the transverse median nervure joining the median vein very much *before* the origin of the basal nervure; ♀ antennæ filiform, the flagellar joints subdentate beneath, or clavate; ♂ antennæ flabellate or ramose; first dorsal abdominal segment with a median slit.....Subfamily II., Pterygophorinae.

Submedian and median cells equal or nearly so, the transverse median nervure being interstitial with the basal nervure; antennæ short clavate in both sexes, 6- or 7-jointed; first dorsal abdominal segment entire.....Subfamily III., Perginae.

Subfamily I.—LOBOCERINÆ.

This group, but without proper characterization, was first recognized as a subfamily by Mr. W. F. Kirby, of the British Museum, who placed in it only three genera, viz.: *Perantherix*, Westw. (= *Acordulecera*, Say); *Loboceras*, Kirby, and *Aulacomeres*, Spinola. The other genera, recorded below, he placed with the Cimbicidæ.

The subfamily is very sharply separated from the other two subfamilies, here defined for the first time, by the characters made use of in my table.

The group is confined principally to the Neotropical region, no species being known outside of the American faunæ—North, Central and South America—*Acordulecera*, Say, being the only genus which has been enabled to extend its range into the Palearctic region.

The larvæ of at least one of the genera is known: *Acordulecera dorsalis*, Say, having been bred and described by Dr. H. G. Dyar.*

The genera may be easily recognized by the use of the following table:

Table of Genera.

Hind wings with one closed submarginal cell.

Front wings with four submarginal cells, the second and third each receiving a recurrent nervure..... 2.

Front wings with three submarginal cells, the first and second each receiving a recurrent nervure.

Antennæ short, 6-jointed; middle and hind tibiæ with lateral spurs..... *Acordulecera*, Say (= *Perantherix*, Westw.).

2. Antennæ 8-jointed or more.. 3.
Antennæ 7-jointed.

First joint of flagellum not so long as joints 2-3 united; hind tibiæ without a lateral spur, the inner apical spur very long *Loboceras*, Kirby.

First joint of flagellum longer than joints 2-3 united; hind tibiæ with a lateral spur..... *Incalia*, Cameron.

3. Antennæ 8-jointed; middle and hind tibiæ with lateral spurs *Paralypia*, Cameron.

Antennæ 9-jointed; middle and hind tibiæ without lateral spurs..... *Aulacomerus*, Spinola.

Antennæ 10-jointed, the third joint about as long as joints 4-5 united, or a little longer, but slenderer; middle and hind tibiæ with lateral spurs..... *Cerealces*, Kirby.

Subfamily II.—PTERYGOPHORINÆ.

The credit for this subfamily should be given to Mr. Peter Cameron, who, in his Monograph of the British Phytophagous Hymenoptera, Vol. III., p. 72, remarks as follows: "*Pterygophorus* also belongs to a distinct subfamily, which differs both from the *Lophyrina* and *Perreyina* in the lanceolate cell being obsolete. The accessory nervure in the hind wings is also absent; the latter have only one middle cellule and the anterior are appendiculated."

*CAN. ENT., Vol. XX., 1895, p. 208.

The subfamily is apparently confined to the Neotropical and Australian regions, no species being known in our fauna north of Mexico.

The genera recognized may be tabulated as follows :

Table of Genera.

- Front wings with three submarginal cells.....2.
 Front wings with four submarginal cells, the hind wings with one closed submarginal cell (except in *Syzygonia*, Klug, which has two).
 Second and third submarginal cells each receiving a recurrent nervure4.
 Second submarginal cell receiving both recurrent nervures.....3.
 2. First and second submarginal cells each receiving a recurrent nervure ; hind wings with one closed submarginal cell ; antennæ 6-jointed*Thulea*, Say.
 Second submarginal cell receiving both recurrent nervures ; hind wings with one closed submarginal cell ; scutellum rounded behind.
 Antennæ 17-20-jointed, the flagellar joints dentate or with short branches beneath.....*Lophytotoma*, Ashm., n. g.
 (Type *P. interruptus*, Klug.)
 Antennæ 23-jointed, each flagellar joint with a very long branch.
 ♂*Pterygophorus*, Ashm., n. g.
 (Type *P. analis*.)
 3. Scutellum with the hind angles dentate ; antennæ 25-jointed, flabellate.
 ♂*Pterygophorus*, Klug.
 (Type *P. cinctus*, Klug.)
 Scutellum posteriorly rounded, not dentate ; antennæ 17-20 jointed, biramose in ♂ *Brachytoma*, Westw.
 (Type *B. fumipennis*, Westw.)
 4. Middle and hind tibiæ with lateral spurs.....5.
 Middle and hind tibiæ without lateral spurs.
 Antennæ 5-jointed, ♀ ; hind wings with one closed submarginal and one closed discoidal cell.....*Syzygonia*, Klug.
 (Type *S. cyanocephala*, Klug.)
 Antennæ 6-jointed, ♀ ; hind wings with one closed submarginal cell, but *without* a closed discoidal cell..*Syzygonidea*, Ashm., n.g.
 (Type *S. cyanea*, Brullé.)
 5. Scutellum rounded behind, unarmed.
 Antennæ 7-jointed.....*Corynophilus*, Kirby.
 (= *Cephalocera*, Klug.)

Antennæ 14-jointed, ♀; third submarginal cell very small, less than half the length of the second *Brachytoma*, Westw.

Scutellum posteriorly bidentate.

Antennæ 8-jointed (or ? more), clavate. ♀. *Pterygophorus*, Klug.

Antennæ 18-jointed, in both sexes, filiform, subserrate, the third joint longer than the fourth *Philomastix*, Froggatt.

Subfamily III.—*PERGINÆ*.

In this subfamily the antennæ are 6- or 7-jointed, clavate, and alike in both sexes; the cubitus always originates from the subcostal vein away from the apex of the basal nervure; the costal vein is considerably thickened; while the transverse median nervure is interstitial, or very nearly so, with the basal nervure.

These characters at once separate the group from the two preceding.

The larvæ too, judging from what has been published respecting them, are also quite different. Unfortunately, the published descriptions of them are very superficial and one can gain little information respecting their structure. Most of them seem to be black or brown, with yellow markings and clothed with short white hairs, which would indicate an affinity with the *Selandriide*. According to Mr. R. H. Lewis and Mr. W. W. Froggatt, they live on various species of gum trees belonging to the genus *Eucalyptus* — trees indigenous to Australia.

A most remarkable habit of maternal insect in the female of *Perga Lewisii*, Westw., and the only case known among the Terebrant Hymenoptera, is recorded by Mr. Lewis.* He says: "The larvæ when hatched are of a dirty green colour, with shining black heads; they keep together in the brood, arranging themselves in oval masses, their heads pointed outwards; but sometimes I have seen them arranged on both sides of the leaves, their heads pointed towards the edges. . . . The mother insect follows them, sitting with outstretched legs over her brood, preserving them from the heat of the sun, and protecting them from the attacks of parasites and other enemies with admirable perseverance. I endeavoured to drive some from their posts by pricking them with the point of a black-lead pencil; but they refused to leave, seizing whatever was presented to them in their mandibles, no doubt very formidable weapons when employed against their race. They never attempted to use their wings or move from the spot."

*Trans. Ent. Soc., Lond., Vol. I., 1836, p. 232.

The genera are not numerous and may be separated as follows :

Table of Genera.

- Hind wings with one closed submarginal cell.
 Front wings with four submarginal cells.....3.
 Front wings with three submarginal cells.....2.
2. First submarginal cell receiving both recurrent nervures ; antennæ 6-jointed..... Paraperga, Ashm., n. g.
 (Type *P. jucunda*, Kirby.)
 First and second submarginal cells each receiving a recurrent nervure ; antennæ 7-jointed..... Pseudoperga, Ashm., n. g.
 (Type *P. polita*, Leach.)
3. Antennæ 6-jointed, joints 3 to 5 of an equal length or nearly so ; head subquadrate, scarcely so broad as the thorax ; first submarginal cell not unusually small..... Perga, Leach.
 Antennæ 7-jointed ; head very large quadrate, fully as broad or a little broader than the thorax ; first submarginal cell very small, half the length of the second, or smaller..... Neoperga, Ashm., n. g.
 (Type *P. amenaida*, Kirby.)

DIASPIS AMYGDALI IN MASSACHUSETTS

BY R. A. COOLEY, B. S., AMHERST, MASS.

In January of this year Mr. A. H. Kirkland sent me specimens of a scale insect he had taken from *Prunus mume* at the Arnold Arboretum, Jamaica Plain, Mass., which on examination proved to be *Diaspis amygdali*, Tryon. A little later Mr. Kirkland sent me more specimens which he had taken from *Prunus subhirtella* at the Arboretum. Specimens of the scale were sent to Dr. L. O. Howard, who confirmed my identification, stating also that he had asked Mr. Coquillett to examine the specimens and had received the report that he could find no difference between them and *Diaspis amygdali*. The infested trees came from Japan, the *Prunus mume* in the spring of 1894 and the *Prunus subhirtella* in the spring of 1897.

These specimens, with others of the same species received from various sources, have been compared with specimens of *Chionaspis prunicola*, Maskell, received from the author of the species, without finding the slightest difference. I therefore consider *Chionaspis prunicola* a synonym of *Diaspis amygdali*, which has priority.